

ASSESSMENT OF BUILDING MAINTENANCE MANAGEMENT PRACTICE AND OCCUPANT SATISFACTION OF SCHOOL BUILDINGS IN PERAK, MALAYSIA

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Graphical abstract



Abstract

A properly implementation of maintenance management is able to extend the building life spans and the unnecessary failure of the building element can be avoided. To develop an adequate environment that encourage learning and teaching, maintenance have to be undertaken wisely in the school buildings. However, the awareness of the importance of the school maintenance management is still very low in Malaysia. Thus, the main purpose of this study is to determine the current maintenance practice provided by District Education Office with the satisfaction level of user regarding to the maintenance management practice in school buildings. All the data will be collected through interview, visual inspection and questionnaires. In this study, the conclusion shown that most of the schools are still not yet up to the satisfaction level in terms of the maintenance practice.

Keywords: Building maintenance management, occupant satisfaction, school building

Abstrak

Pelaksanaan pengurusan penyelenggaraan boleh memanjangkan jangka hayat bangunan dan kegagalan elemen bangunan dapat dielakkan. Penyelenggaraan perlu dilaksanakan dengan bijak dalam bangunan sekolah kerana ia dapat membangunkan persekitaran yang baik untuk mengalakkan pembelajaran. Walau bagaimanapun, kesedaran tentang kepentingan pengurusan penyelenggaraan sekolah masih rendah di Malaysia. Oleh itu, tujuan utama kajian ini adalah untuk menentukan amalan penyelenggaraan semasa yang disediakan oleh Pejabat Pelajaran Daerah dengan tahap kepuasan pengguna berhubung dengan amalan pengurusan penyelenggaraan di bangunan sekolah. Semua data yang akan dikumpul melalui temuduga, pemeriksaan visual dan soal selidik. Dalam kajian ini, kesimpulan menunjukkan bahawa kebanyakan sekolah masih belum sampai ke tahap kepuasan dari segi amalan penyelenggaraan.

Kata kunci: Bangunan pengurusan penyelenggaraan, kepuasan penghuni, bangunan sekolah

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1.0 INTRODUCTION

Maintenance has to perform effectively in buildings due to buildings cannot remain zero defects throughout their lifespans. The need for maintenance will be intensified, especially aged buildings because of the need to replace or repair more components which have reached their useful lifespans. It is therefore maintenance is considered as an

essentially activity where it can provide support to the building lifestyle and maintains the value of asset of the country. In general, the main objective of building maintenance is to retain a building in its original stage, as far as possible to serve its function wisely to an appropriate condition [1, 2]. Maintenance can be defined as an activity that starts from building handover to demolition [3]. The

task of the maintenance includes servicing, inspection, replacement, renovation and overhaul.

In this paper, maintenance is defined as an activity to preserve; repair and care for the school buildings fabric and services in order to ensure building perform its intended functions throughout its lifespan after completion to current standard. In Malaysia, the school maintenance management is still practiced in an unsatisfactory level which leads to negative impact to the facilities provided due to lack of awareness of the importance of maintenance management practice. There are many complaints appeared in the media and journals said that currently most of the school buildings have many building defects that can pose a danger to the students. For example, ceiling was collapsed at SJK (T) Serdang (16 February 2012, The Star). In 19 October 2012, another same tragedy was happened in which ceiling collapsed at Sekolah Agama Rakyat Masjid Tuan Guru (Sinar Harian). Even though there are many factors that lead to low quality building performance, much of the problems are related to the building maintenance management practice.

Since school buildings that are established to provide a conducive environment that used for teaching purpose so that building should always maintained wisely [4, 5, 6]. For this study, the objective was to evaluate the current maintenance management practice of school buildings in Perak. A good maintenance management practice can increase the satisfaction level of the user; this can be explained as higher occupant satisfactions rely on the quality of maintenance management practice provided by the maintenance department. Therefore, to achieve the high quality standard of the building maintenance management, the good maintenance management required meets as close as possible to the user's satisfaction [7].

2.0 LITERATURE REVIEW

Maintenance has been defined by various authors. The first author defines maintenance as a work carried out to keep, restore or improve every part of a building, its services and surrounds to a currently acceptable condition[8]. A latter researcher stated that maintenance is defined to keep the building in its existing state and in high quality operating condition and preserve[9]. The definitions of the maintenance are always related to the building, to the extent that the building shall be good enough to allow the occupants to use their functions, because it is a sources of value that design to provide necessary services of daily activities [10].

According to the research done by syamilah, the results shown that 90% of the respondents considered that school building maintenance management practice shall be improve in Malaysia due to most of the education department are more depends on reactive and condition based maintenance practice. No planned maintenance was observed

and only unplanned maintenance was applied when necessary. If improper practiced of the planned maintenance, the chance of breakdown of the building elements is higher. There are more than 50 schools in Petaling Jaya was observed and having problems of lack of maintenance [11]. To improve the occupant satisfaction regarding maintenance management practice provided by the education department, proper planned maintenance management practice shall be performed.

3.0 METHODOLOGY

Research methodology can be seen as the techniques used to collected and analyze data. The data collected have to be related to the objective and problem statement. There are four types of methods that used in this study to obtain the relevant data which are literature review, interview, questionnaire and visual inspection.

3.1 Selecting Case Studies

The selecting schools buildings are based on those school buildings have high frequency of complaint records in the three District Education Offices. School C, D and E were selected from B District Education Office, while school F and G were chosen from C District Education Office. Only two school buildings which is school A and B were selected from A District Education Office. The districts are located within the same geographical zone.

3.2 Interview

In depth interviews were conducted with three senior supervisors from District Education Offices respectively. The questions are designed mainly in the types of maintenance they were applied, the frequency of their training and maintenance budget.

3.3 Questionnaires

To get more detailed information from the respondents, questionnaires survey were established. The purpose of questionnaire is to identify the satisfaction level of the principals, teachers and staffs about the school building maintenance practice. Each of the school building will receive 10 questionnaires and thus a total of eighty (80) questionnaires were sent out to the eight school buildings.

3.4 Visual Inspection

Visual inspection was undertaken to the eight selected school buildings in order to know the current condition of the building elements. The visual inspections were carried out without using any instrument, but photons have been taken for the

purpose of given a strong evident to support the results of study.

4.0 RESULTS AND DISCUSSION

The data collected from the interview, questionnaire and visual inspection will be analyzed and discussed.

4.1 Interview

Interview questions are used to determine the current maintenance management practice in school buildings.

Table 1 Comparison of the maintenance management practice

Questions	A District Education Office	B District Education Office	C District Education Office
School buildings	73	164	80
Types of maintenance	Unplanned & planned maintenance	Unplanned maintenance	Unplanned & planned maintenance
Time to respond to maintenance request	Emergency – immediately respond Normal – Take time and have to wait	Emergency – immediately respond Normal – Take time and have to wait	Emergency – immediately respond Normal – Take time and have to wait
Annual maintenance budget	Around 1.2-1.5 million	More than 1.5 million	Around 1-1.5 million
Lack of maintenance staff	Enough maintenance staff	Not enough maintenance staff	Enough maintenance staff
Computerize Maintenance Management System (CMMS) method	No CMMS method	No CMMS method	No CMMS method

For this study, researcher found that A and B District Education Office have 73 and 80 school buildings respectively with using the planned and unplanned maintenance while for the B District Education Office, the number of school buildings is more than 100 but only using unplanned maintenance. In the A and C District Education Office, planned maintenance is performed at the end of December or January before the school is reopening. At that time, maintenance staffs will go to check the condition of the school building element. However, the planned maintenance is not fully utilized because they do not carry out it after the school building is reopened due to lack of maintenance budget. Time to response to the maintenance request is almost based on the emergency. If emergency work happened, the response of the maintenance work will be carried out immediately, while if the problems are minor, the response of the maintenance work will be taken some time due to budget constraints.

The annual maintenance budget of the B District Education Office is more than one million while the other two District Education Offices have the annual maintenance budget of around one million. Even though Ministry of Education have allocated maintenance budget to all the District Education Office, it was still considered not enough due to the building age are keeping increase and required more maintenance budget to repair the building elements that have reached their useful lifespans.

Only B District Education Office was faced the problem of insufficient maintenance staff and this problem was caused them to delay carry out the maintenance work in some school buildings. Three District Education Offices were not use the computerize maintenance management system method to arrange the complaint report. It is therefore sometimes the senior supervisor will mislaid the complaint report. Based on the comparison, we can concluded that the maintenance management practice in the B District Education Office is weak than the other two District Education Office because B District Education Office was not implemented of the planned maintenance while A and C District Education Office have implemented of planned maintenance at the end of December or January.

4.2 Questionnaire

4.2.1 Overall Occupant Satisfaction for Implementation of Maintenance Work in Eight School Buildings

Figure 1 show overall occupant satisfaction level for implementation of maintenance work on the building elements in eight selected school buildings. According to the results analyzed, the highest overall satisfaction mean value is 3.51 in school B. This results show that majority respondents in school B are satisfied in the overall maintenance management practices provided. The lowest satisfaction level for implementing of maintenance work is in school E with the overall mean value of 2.86. Apart from this, the overall mean value of school C, D and E are not more than 3.0 that are 2.92, 2.9 and 2.86 respectively. This results shows that the respondents are neither satisfied nor dissatisfied with a trending towards dissatisfaction. The rest of the school building are also in the extent of neutral but the overall mean value of them are more than 3.0 which means that these school buildings are more toward to satisfaction level. School C, D and E were managed by the B District Education Office and currently have the lowest satisfaction level than the others schools building due to poor maintenance management practice provided by the B District Education Office. This statement can be supported by Table 1 above which indicates B District Education Office has the poor maintenance management practice since there do not undertake planned maintenance and sometimes will delay to carry out maintenance work due to maintenance staff are not enough and

budget constraint. School A, B, F, G and H have highest satisfaction level because they were managed by A and C District Education Office. Table 1 above have indicates the A and C District Education Office provide a little bit good maintenance management practice than B District Education Office.

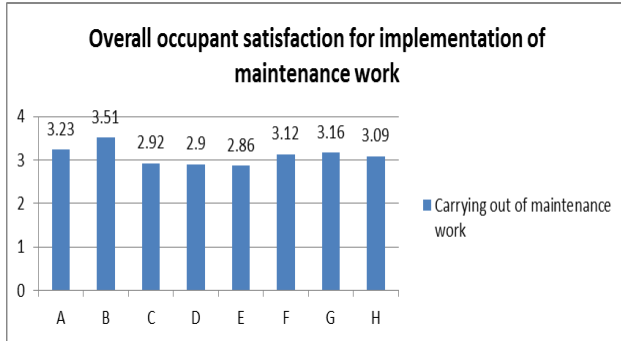


Figure 1 Overall occupant satisfaction for implementation of maintenance work in eight school buildings

4.2.2 Overall Occupant Satisfaction on the Delivery Characteristic in Eight School Buildings

Figure 2 indicates overall occupant satisfaction on the delivery characteristic in eight school buildings. Based on the data analyzed, the school E has the lower satisfaction on the delivery characterize that is 2.42 than the other seven selected school buildings. The second lowest satisfaction on the delivery characteristic is in school C with a mean value of 2.57. The difference mean value between school E and C is 0.15. In school D, the mean value of the overall satisfaction on delivery characteristic is 2.93. The highest satisfaction level on the delivery characteristic is 3.47 in the school B. It shows that the overall mean value in school B is trending towards to satisfaction. This statement can be proof by Table 1 above which shown that A and C District Education Office were provide a little good maintenance practice to the school A, B, F, G and H. However, school C and E have lowest satisfaction level. This is because B District Education do not have implement the planned maintenance and with the problem of not enough skilled maintenance staff. All these problems will delay the time to solve the major problem of the school building and in the long run it will lead the school building arisen many problems as it shows in the school C, D and E. Overall it can be concluded that when there have an excellent maintenance management practice, the satisfaction level of the users will be a little higher.

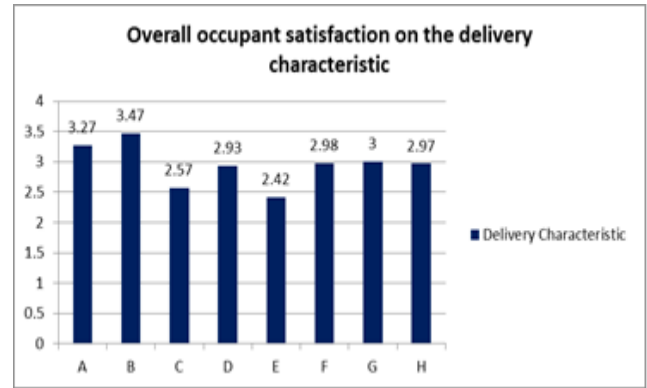


Figure 2 Overall occupant satisfaction on the delivery characteristic in eight school buildings

4.3 Visual Inspection

4.3.1 Roof Condition

Throughout visual inspection, most of the roofs are in the good condition except school E. In school E, majority soffit boards were damaged due to wear and tear and poor installation materials. The problems of the soffit board were not repaired by the related parties even through report have be made. Figure 3 shows the soffit board of the roof was broken. In school B, majority respondents are satisfied with the current condition of the roof due to there are no major problems were found in the roof. There are only have minor defects on the roof soffit board which is peeling paint on soffit board surface as shown in Figure 4.

School E



Figure 3 Damaged of the soffit board

School B



Figure 4 Peeling paint on the soffit board

4.3.2 Wall Finishes

According to the data analysis, most of the school walls are functioned well except school E with majority defect of mould growth as shown in Figure 5. In school E, mould grew aggressively on the surface of paintwork where there was excessive moisture. A simple repainting will not correct the problem for long. It is therefore effective repairing work shall be carried out by the skilled contractor. In school B, the wall finishes are in a good condition due to the presence of the minor wall defects such as hairline cracks and peeling paint. Most of these defects could be rectified by regular maintenance. Figure 6 shows the wall has some peeling paint on the paintwork.

School E



Figure 5 Mould growth on the wall

School B



Figure 6 Minor peeling paint on the wall

5.0 CONCLUSION

This paper is used to determine the current maintenance practice and occupant satisfaction in

the school buildings in Perak. The conclusions for this research are as follows:

1. The data results shows occupant satisfaction in the school building is still not yet up to an acceptable level.
2. District Education Office more prefers unplanned maintenance work since planned maintenance consumed higher overhead costs.
3. There might be a possible relationship between the maintenance management practice and occupant satisfaction level, where there is a slightly good maintenance management practice, the occupant satisfaction will be slightly improved.

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